Annual 2008 VA/DoD Joint Venture Conference

EL PASO
(WBAMC/ELPVAHCS)

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Agenda

- Project Background
- Initial Functional Requirements
- Approach
- Expectation vs. Outcomes
- Imaging Architecture
- How Does It Work?
- Imaging Viewers
- Questions

National Defense Authorization Act (NDAA) Activities

- William Beaumont Army Medical Center/El Paso VA Health Care System
  - Extensive amount of NDAA work accomplished over last four years
  - Assistance with design/testing with Bidirectional Health Information Exchange (BHIE) and other enterprise level products (e.g. LDSI, CHDR)
  - Bidirectional exchange of medical images was approved for final phase of NDAA business plan in April 2006
  - Prototype developed at the enterprise with local input and testing

National Defense Authorization Act (NDAA) Milestones

- Phase 1 – September 2006-May 2007 (Completed)
  - Bidirectional exchange of medical images (referential) and related text information between the VA VistA Imaging Exchange and the DoD's Medical Image Viewer (CR, DX, and CT)
- Phase 2a – May 2007-September 2007 (Completed)
  - Exchange of diagnostic quality images and MRIs
- Phase 2b – October 2007- September 2008 (Underway and On Schedule)
  - Additional modalities
    - Mammography – on Hold
    - Ultrasounds - Testing underway
    - Secondary Capture – If time permits
  - Six additional sites

National Defense Authorization Act (NDAA) Milestones

- HEC IM/IT Work group Approved Expansion – October 2007-September 2008
  - Extension of testing the NDAA prototype to six (6) additional sites;
    - Evans Army Community Hospital & Denver VAMC
    - Naval Health Clinic Great Lakes & North Chicago VAMC
    - Landstuhl Regional Medical Center
    - VA Polytrauma Centers (Richmond and Tampa)
    - NCA-Walter Reed Army Medical Center, National Naval Medical Center, and Malcolm Grow Medical Center & Washington DC VAMC
    - Keesler Medical Center & VAMC Biloxi
- NDAA Project Closeout in El Paso
  - 30 September 2008

Initial Functional Requirements

- The VA and DOD will initially exchange DICOM radiology images for CR, DX, CT, MR modalities. More types will be added over time (e.g.. US, SC, etc)
- Three quality levels: thumbnail, reference, and diagnostic.
- Thumbnails use the JPEG file format; reference and diagnostic images use DICOM JPEG 2000 file format.
- Thumbnail and reference images apply a lossy compression; diagnostic images uses lossless compression ratios.
- Images and metadata will be cached to improve the performance of subsequent requests.
- Web browser viewer capability will be developed for the DoD
- Minimal user interface changes to the VA Clinical Display

Approach

- Uses the existing BHIE framework
  - Proven technology that is already in production.
  - Solves patient cross agency identification.
  - Has necessary approvals to work in both the VA and DOD enterprises.
  - Addresses HIPAA requirements between the VA and DOD enterprises.
- Image Enhance BHIE Framework (BIA)
- Integrates with VistA Remote Image Views
  - To the Clinical Display user, the DOD appears as just another medical facility.
- Reduced development time and cost

Expectations/Outcomes

Expectation

- Transfer of CR, DX, CT, MR, MG, US, and SC images.
- Transfer times of 15 – 45 seconds for a normal X-ray.
- Up to 3 min transfer time for a CT.

- Process will need a high end server to process images locally.
- Possible slowdown of other services due to high bandwidth use by this process.

Outcomes

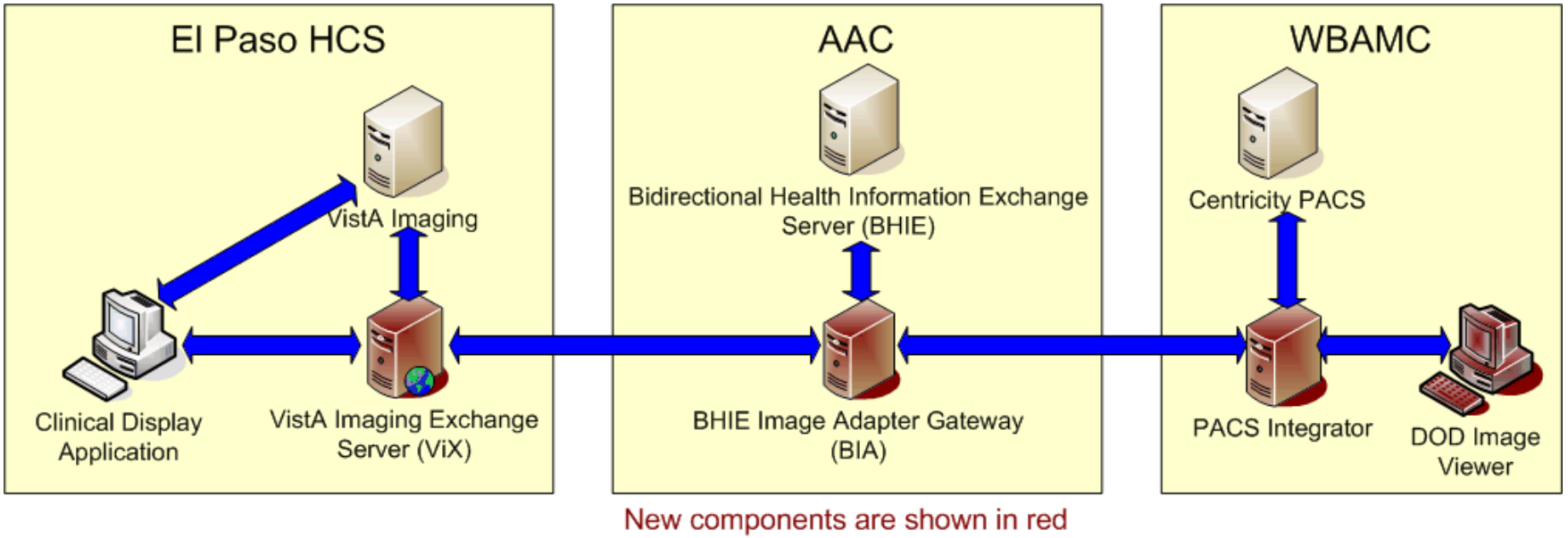
- Transfer of CR, DX, CT, MR, US
- Transfer time of normal x-rays was 5 – 20 seconds.
- CT transfer times is 1 second per image (max). Total transfer time will vary by study size.
- Server device can be scaled down to be more affordable.
- Affect to other programs due to bandwidth utilization was minimal.

Prototype Imaging Deliverables

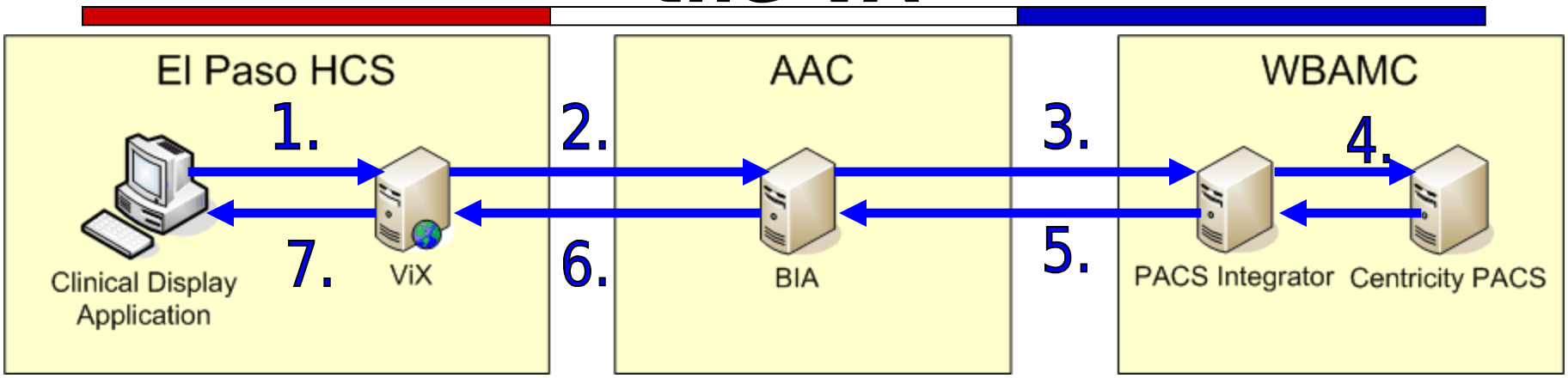
- DoD (WBAMC) –
  - The PACSIntegrator (PI) gateway service:
    - New hardware server to support imaging services
    - Request and cache images from the VA
    - Serve DoD Images to the VA
  - Web-based medical image viewer (MIV)

- VA (El Paso HCS) –
  - The VistA Imaging Exchange (ViX) gateway service:
    - New hardware server to support imaging services
    - Request and cache images from the DOD
    - Serve VA images to the DOD.
  - A modified version of the Clinical Display application that can use the ViX to retrieve DOD Images. This work includes other enhancements to the VA's clinical display software.

Imaging Architecture

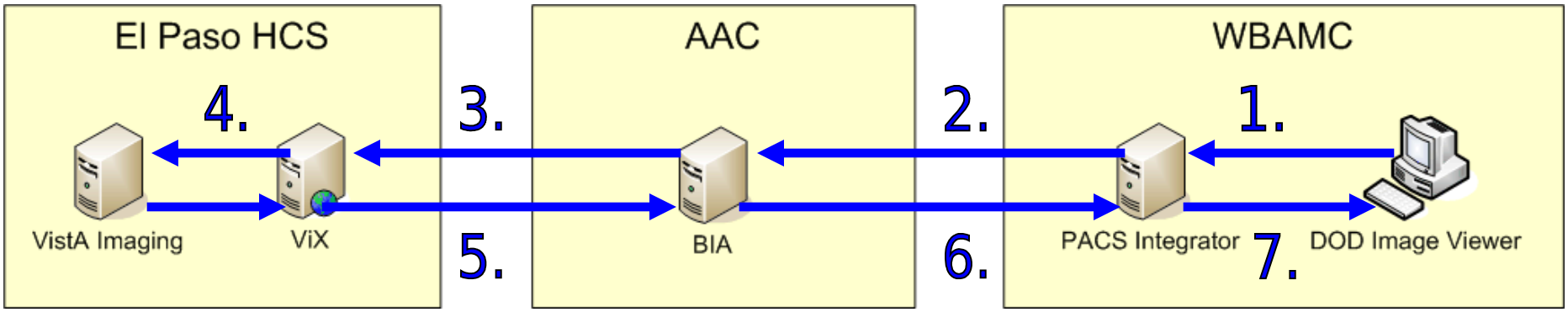


How it works: Viewing DOD Images from the VA



1. Clinical Display User issues an image request.
2. The ViX forwards the request to the BIA at the VA AAC.
3. The BIA forwards the request to the PACS Integrator at the WBAMC.
4. The PACS Integrator retrieves the image from DOD PACS system and caches it.
5. After compressing the image, the PACS Integrator returns the image to the BIA.
6. The BIA returns the image to the ViX which caches it.
7. The ViX returns the image to the Clinical Display User for viewing.

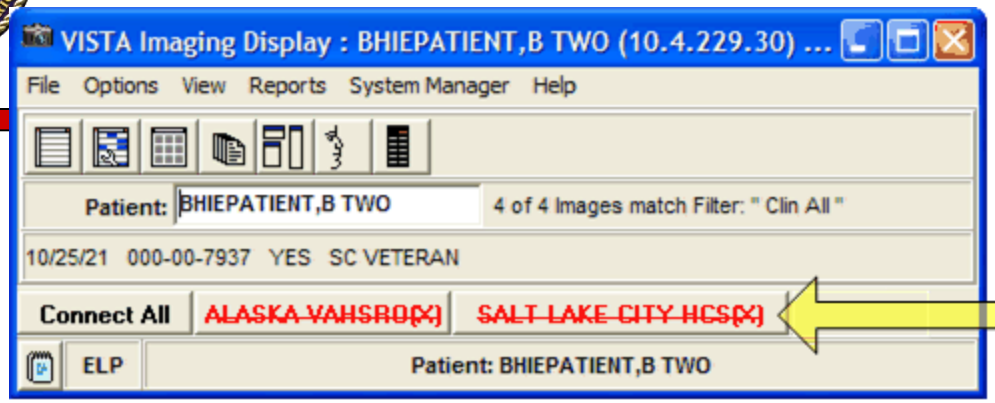
How it works: Viewing VA Images at the DOD



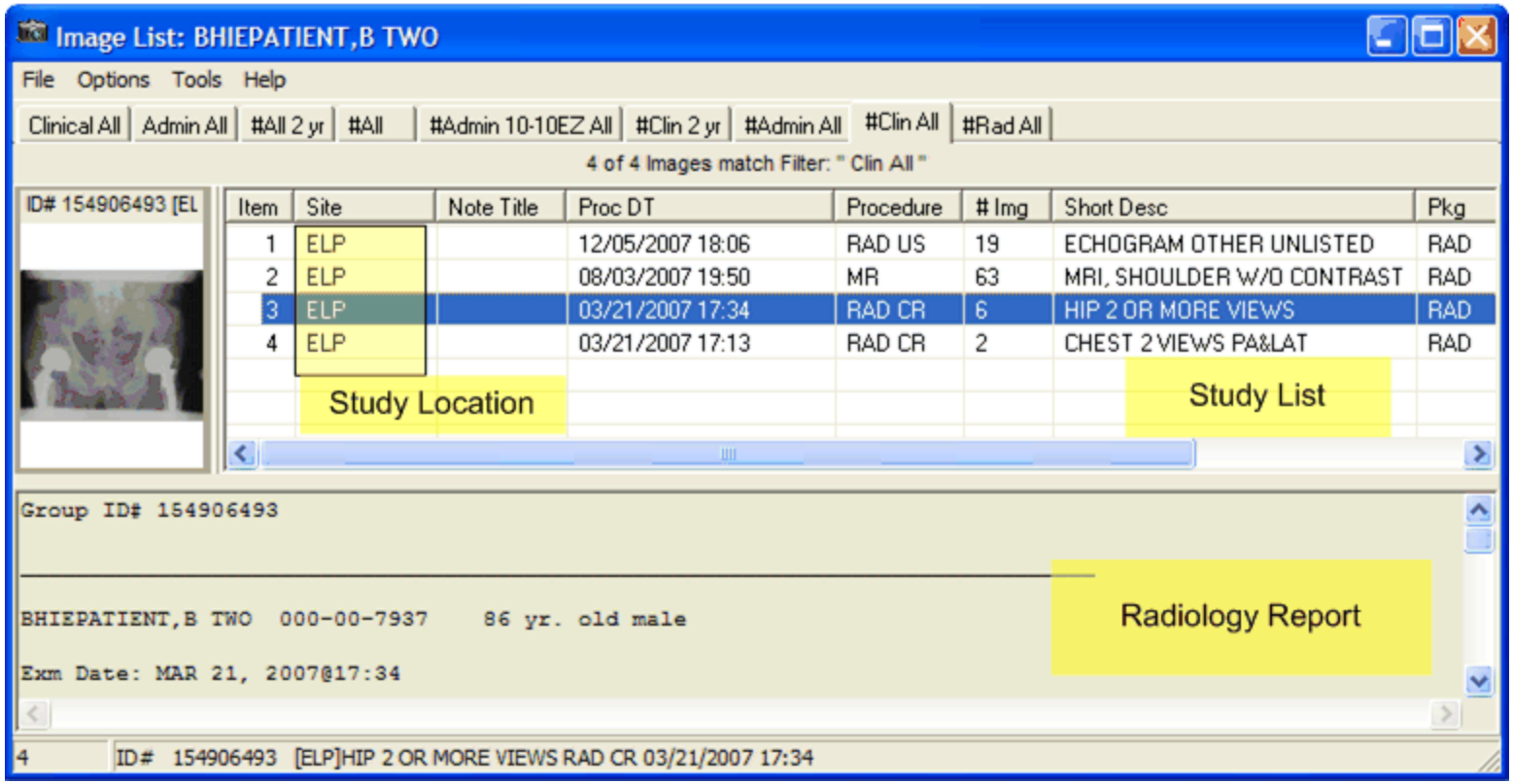
1. The DOD Imaging User requests an image.
2. The PACS Integrator forwards the image request to the BHIE Image Adapter (BIA) in the VA AAC.
3. The BIA forwards the request to the ViX at the El Paso HCS.
4. The ViX queries VistA to locate and retrieve the image.
5. The ViX compresses and DICOM wraps the image (if needed) which is then returned to the BIA which caches it.
6. The BIA returns the image to the PACS Integrator.
7. The PACS Integrator returns the image to the DOD Imaging User for viewing.

VA DIGITAL IMAGING VIEWER

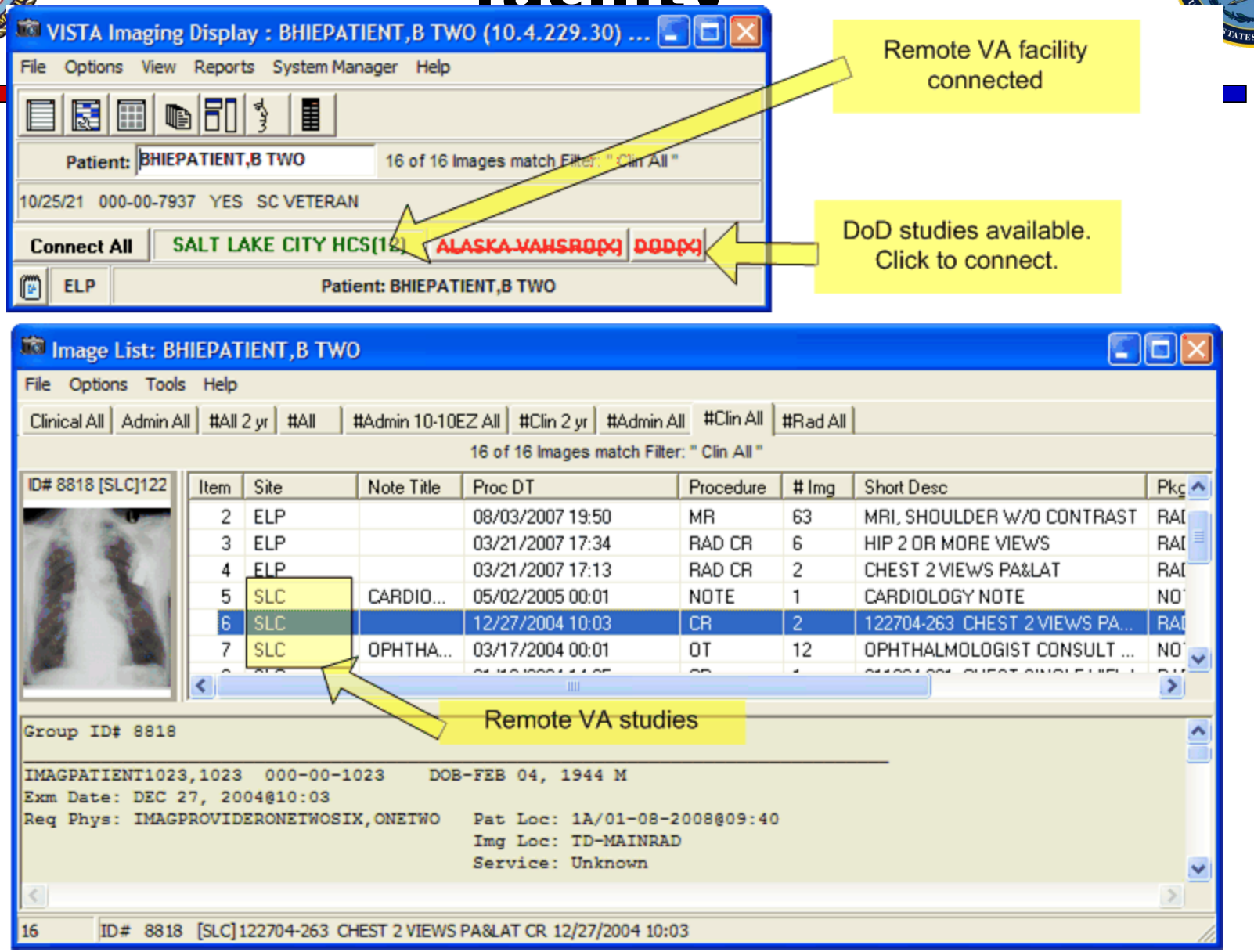
What the Clinician Sees



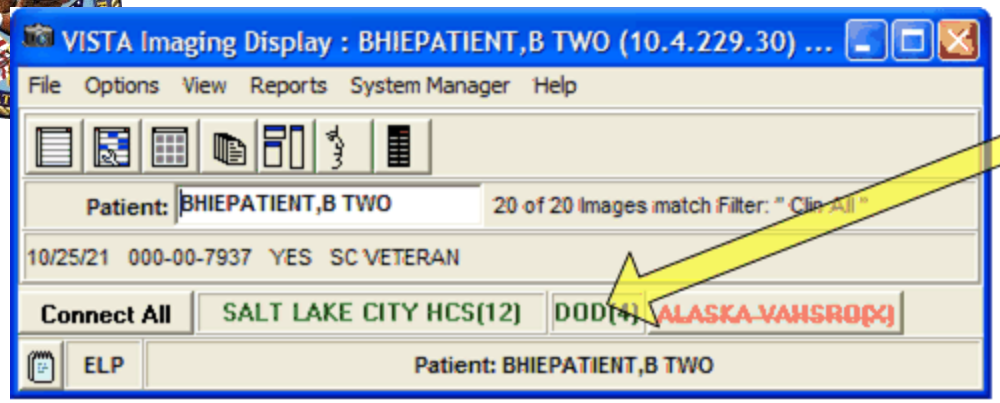
Buttons show facilities where patient has been seen. Click to connect.



Connecting to a remote VA facility

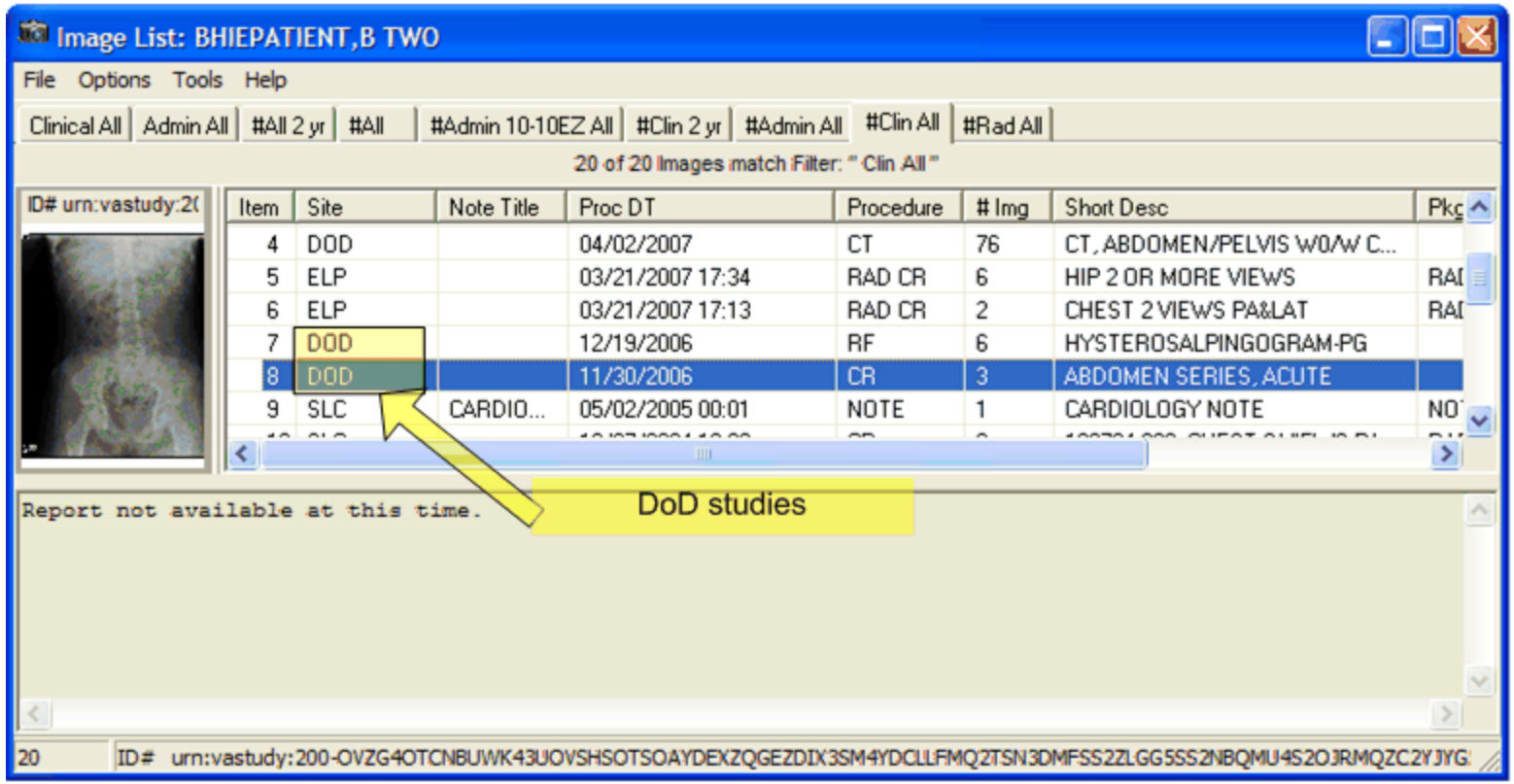


Connecting to the DoD

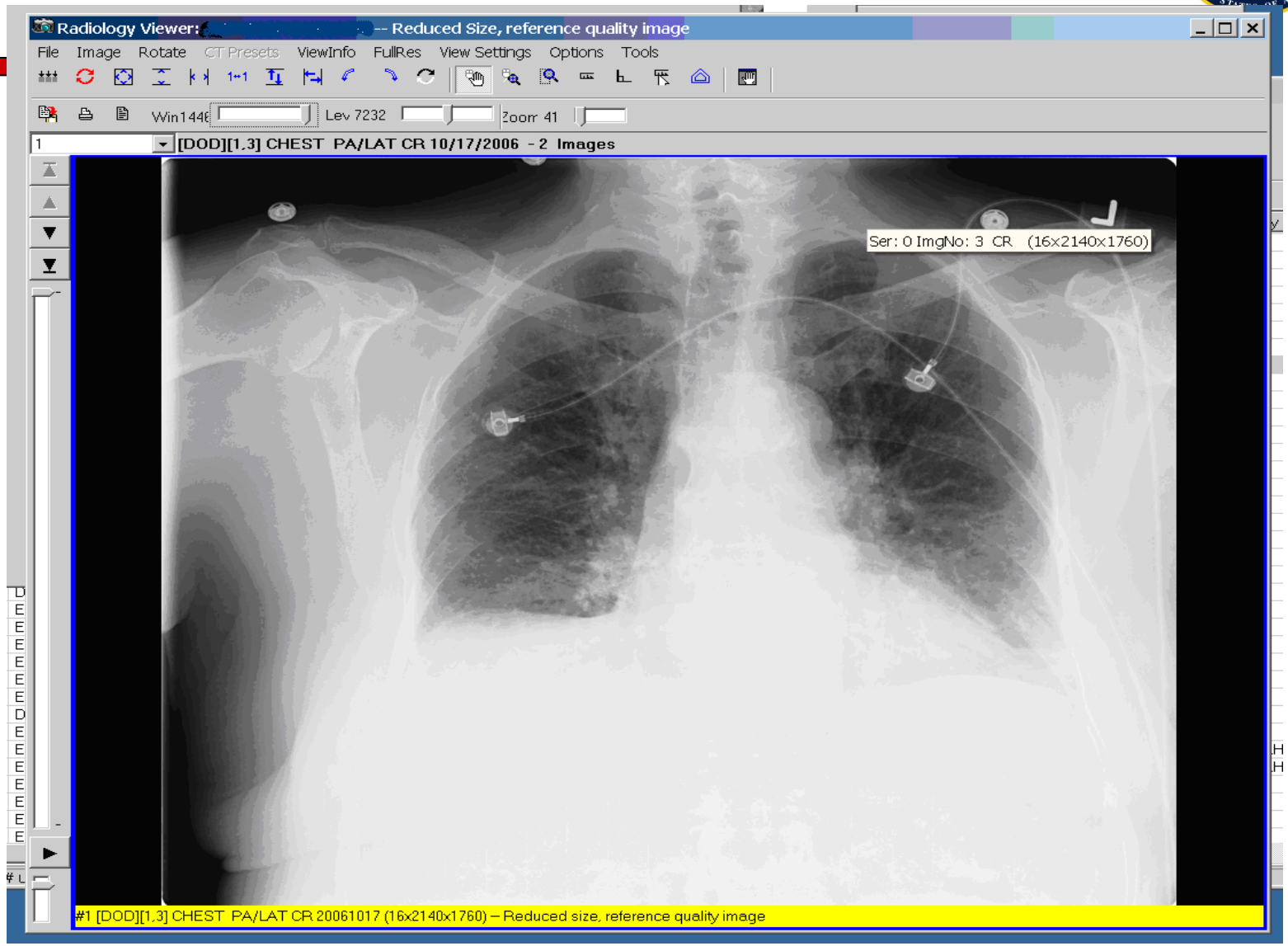


DoD connected

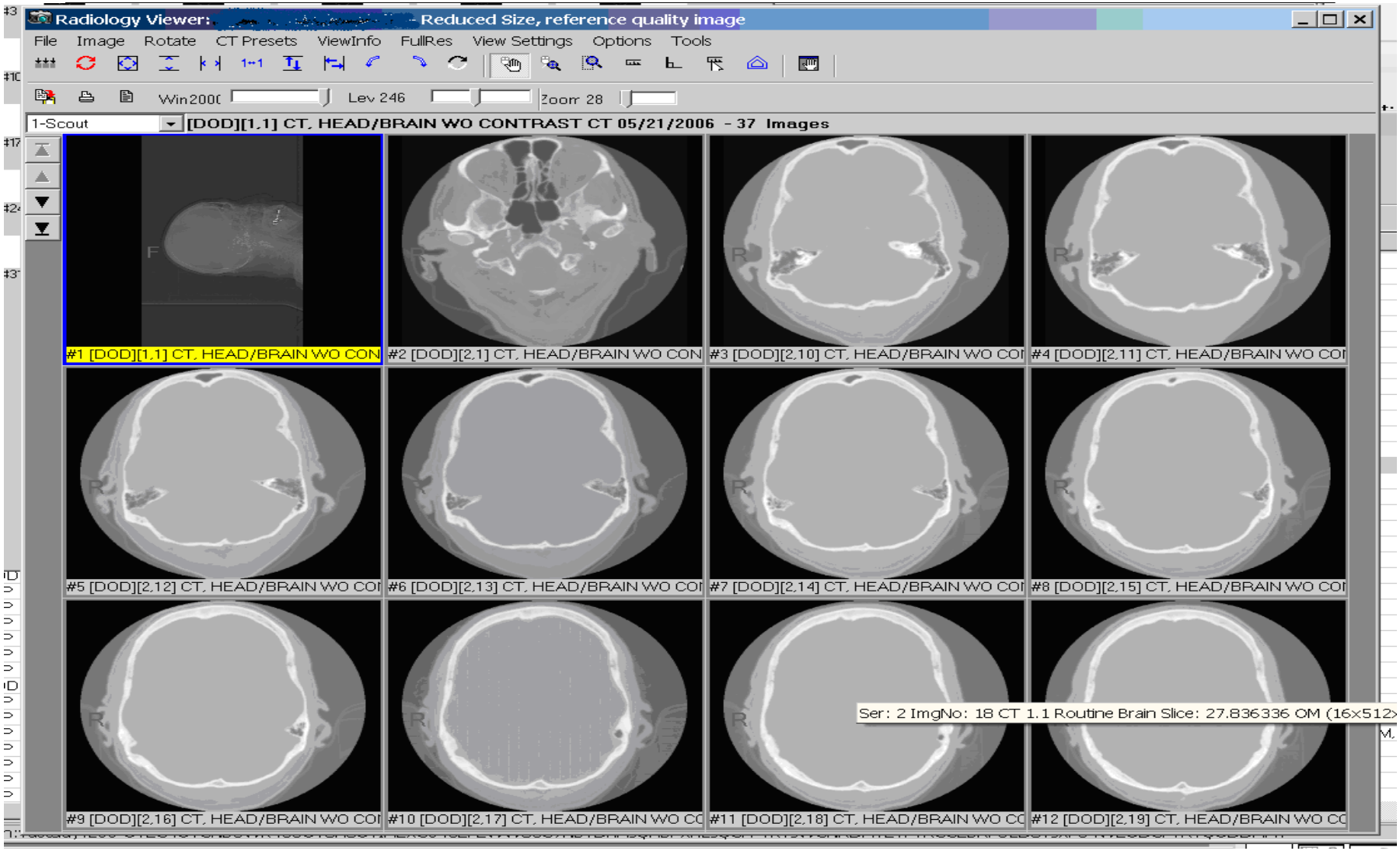
- Seamless integration
- No learning curve for Clinician



CR Image


Radiology Viewer: -- Reduced Size, reference quality image
File Image Rotate CT Presets ViewInfo FullRes View Settings Options Tools
Win144 Lev 7232 Zoom 41
[DOD][1,3] CHEST PA/LAT CR 10/17/2006 - 2 Images
Ser: 0 ImgNo: 3 CR (16x2140x1760)
#1 [DOD][1,3] CHEST PA/LAT CR 20061017 (16x2140x1760) -- Reduced size, reference quality image

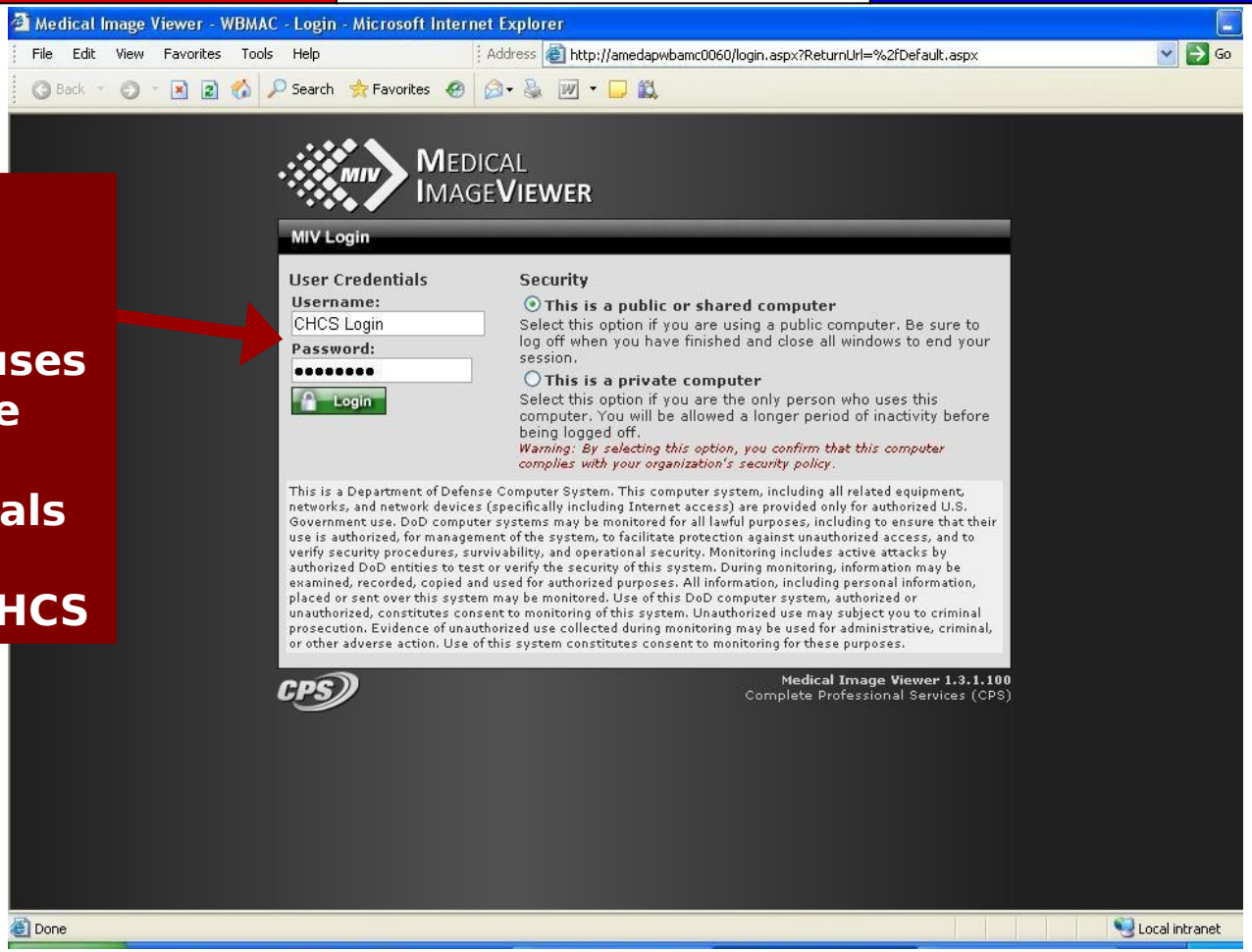
CT Image (Single or multi)



DOD DIGITAL IMAGING VIEWER

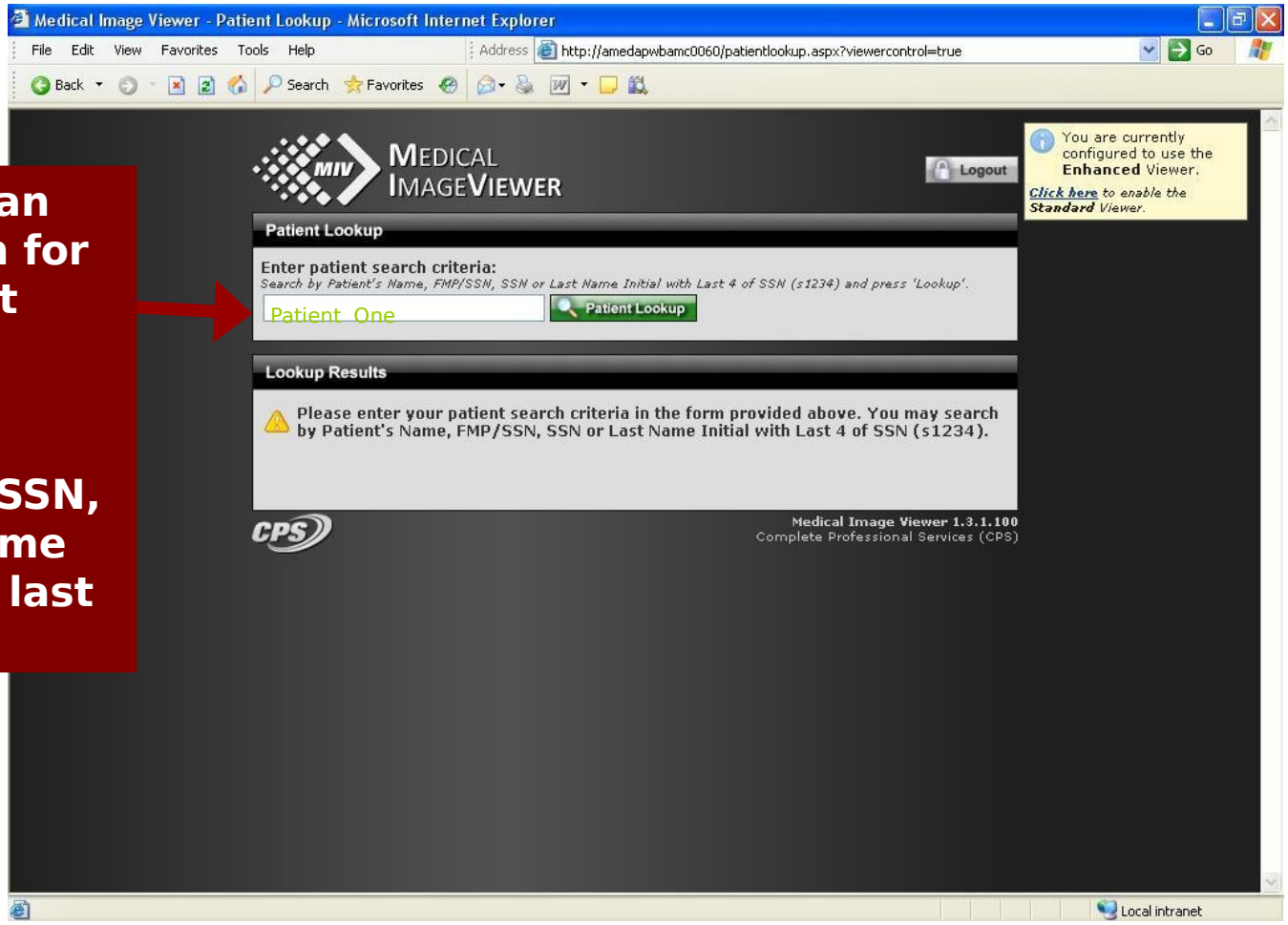
Medical Image Viewer Login

The DoD Medical Image Viewer uses the same user credentials as AHLTA/CHCS

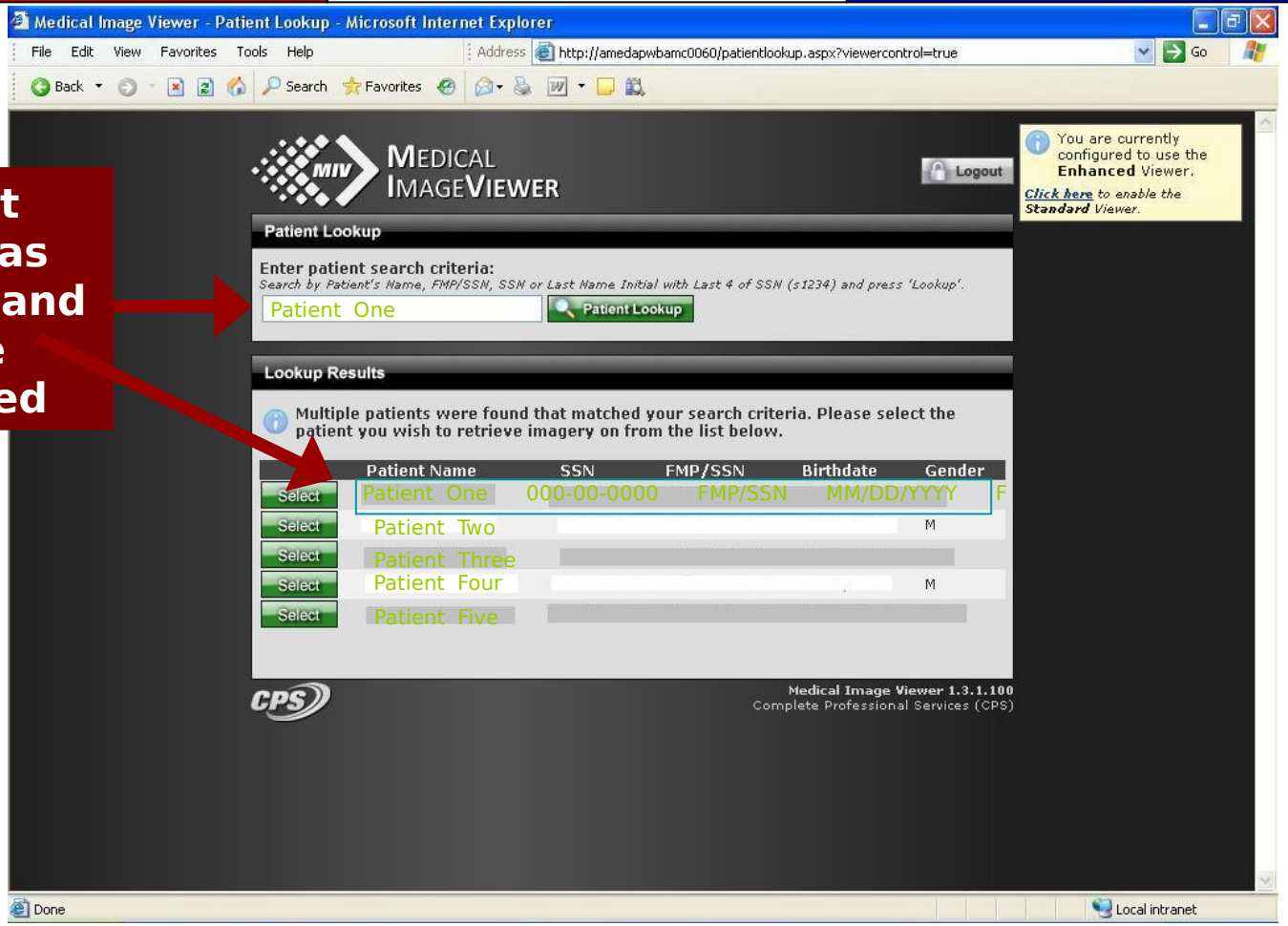


Medical Image Viewer Patient Search

The clinician can search for the patient using the Patient's Name, FMP/SSN, SSN, or Last Name Initial and last 4 of SSN.

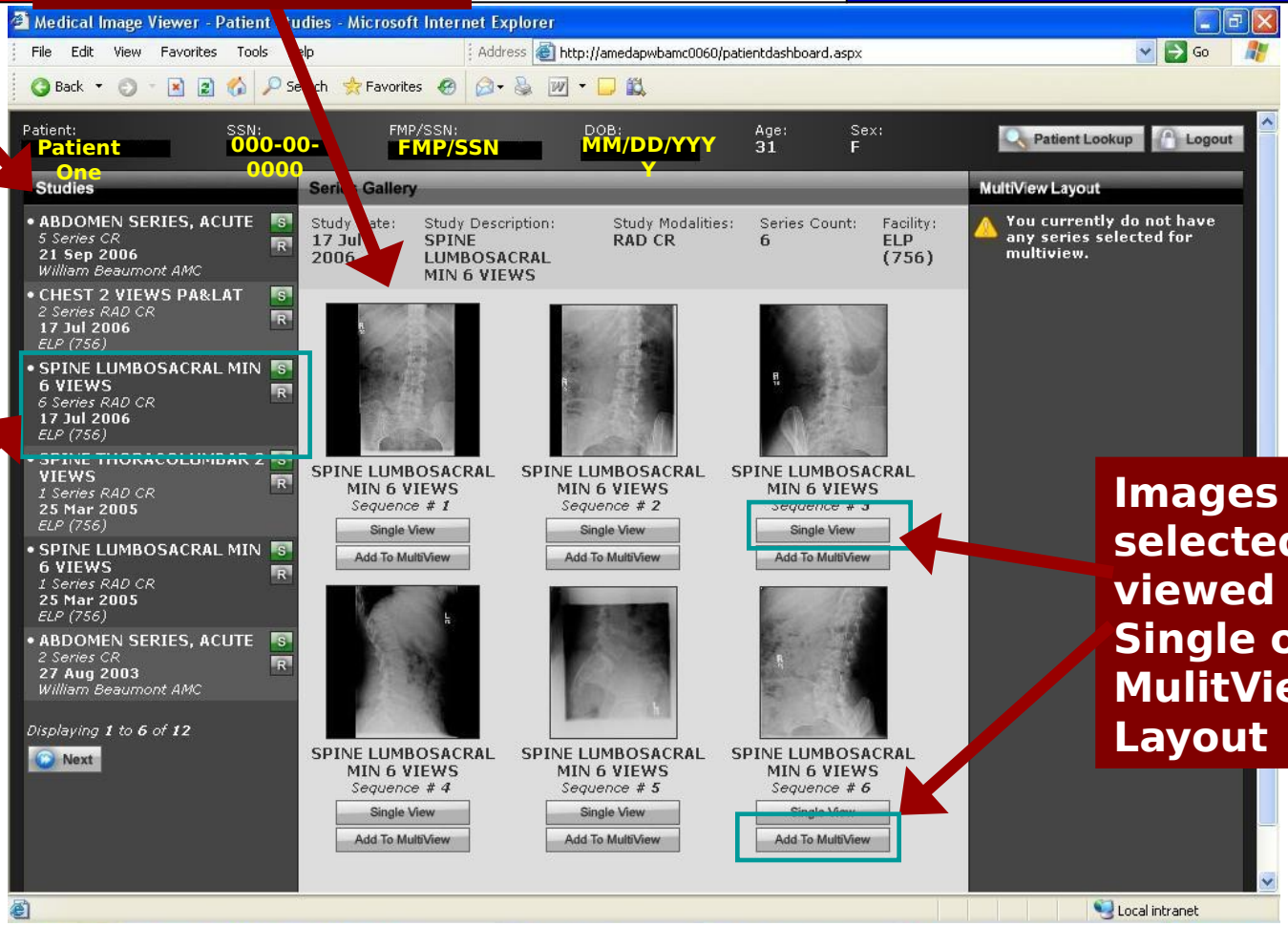


Medical Image Viewer Patient Selection



Patient One was found and can be selected

Medical Image Viewer Patient Search

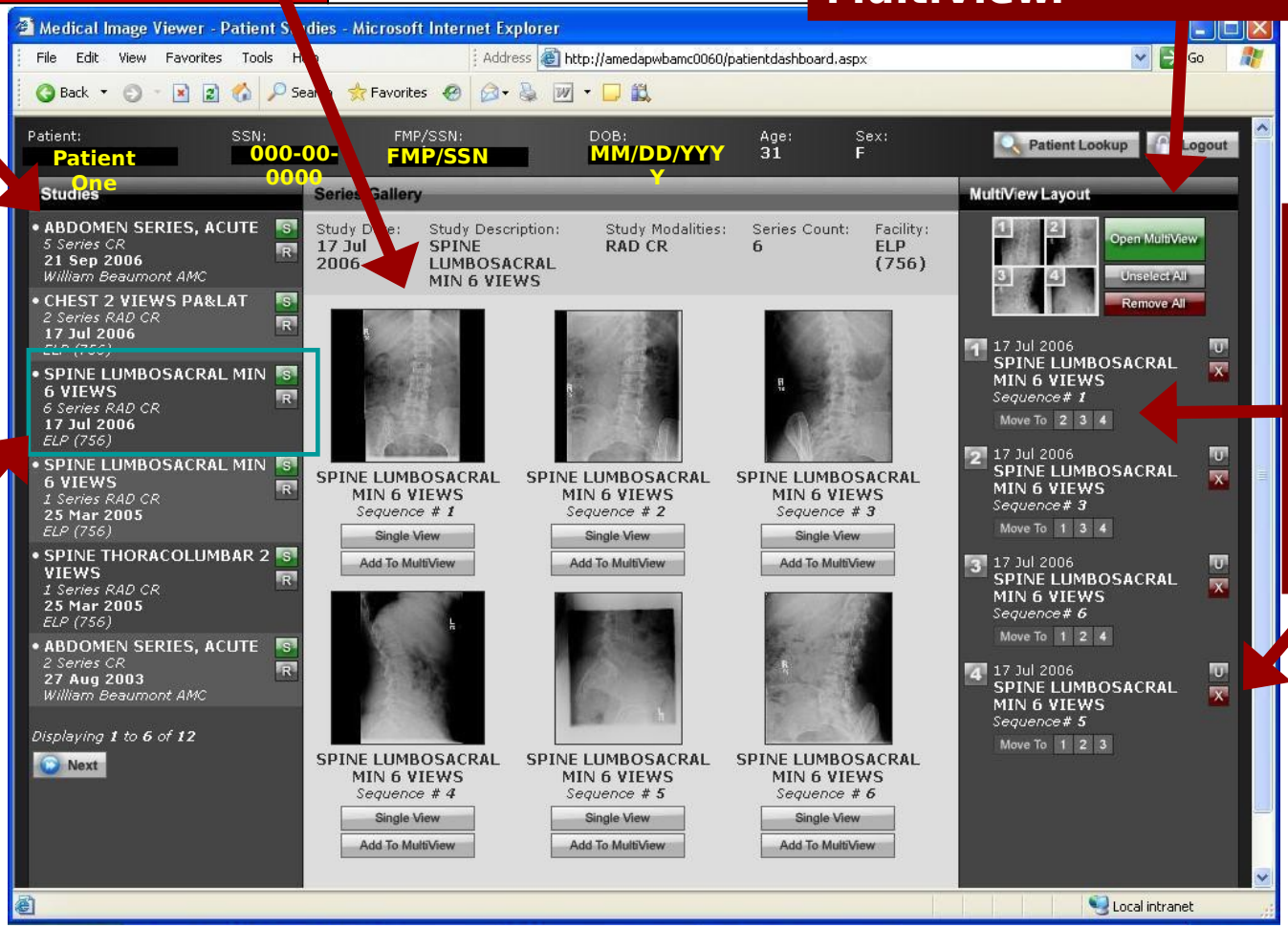


Medical Image Viewer Patient Search

Thumbnails of the images in the series

Added four sequences to view in MultiView.

List of Studies

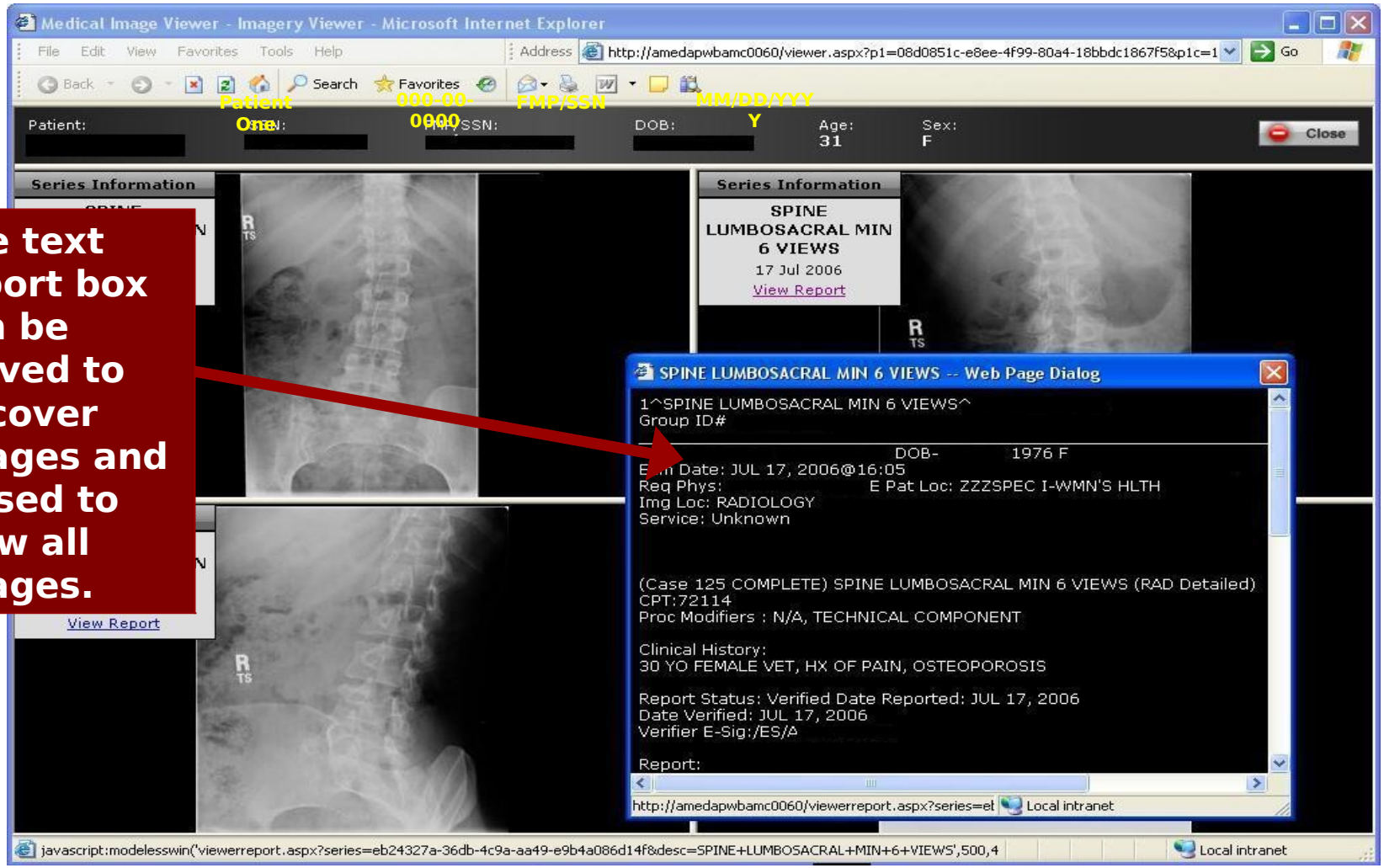


Selected Study From VA El Paso

Images can be reordered and removed from MultiView

Medical Image Viewer Patient Search

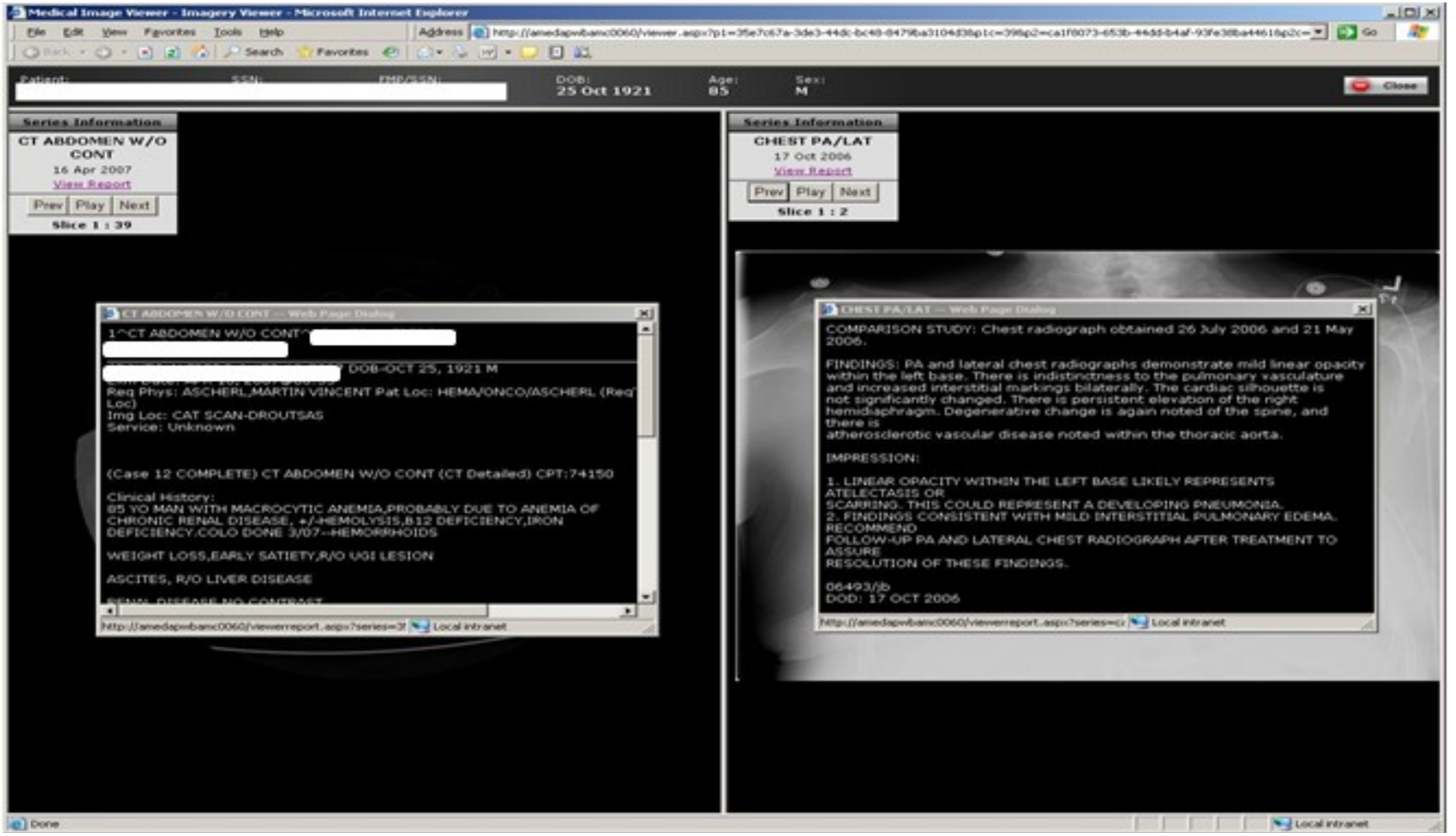
VA Images are displayed in MultiView along with the related VA radiology text report.



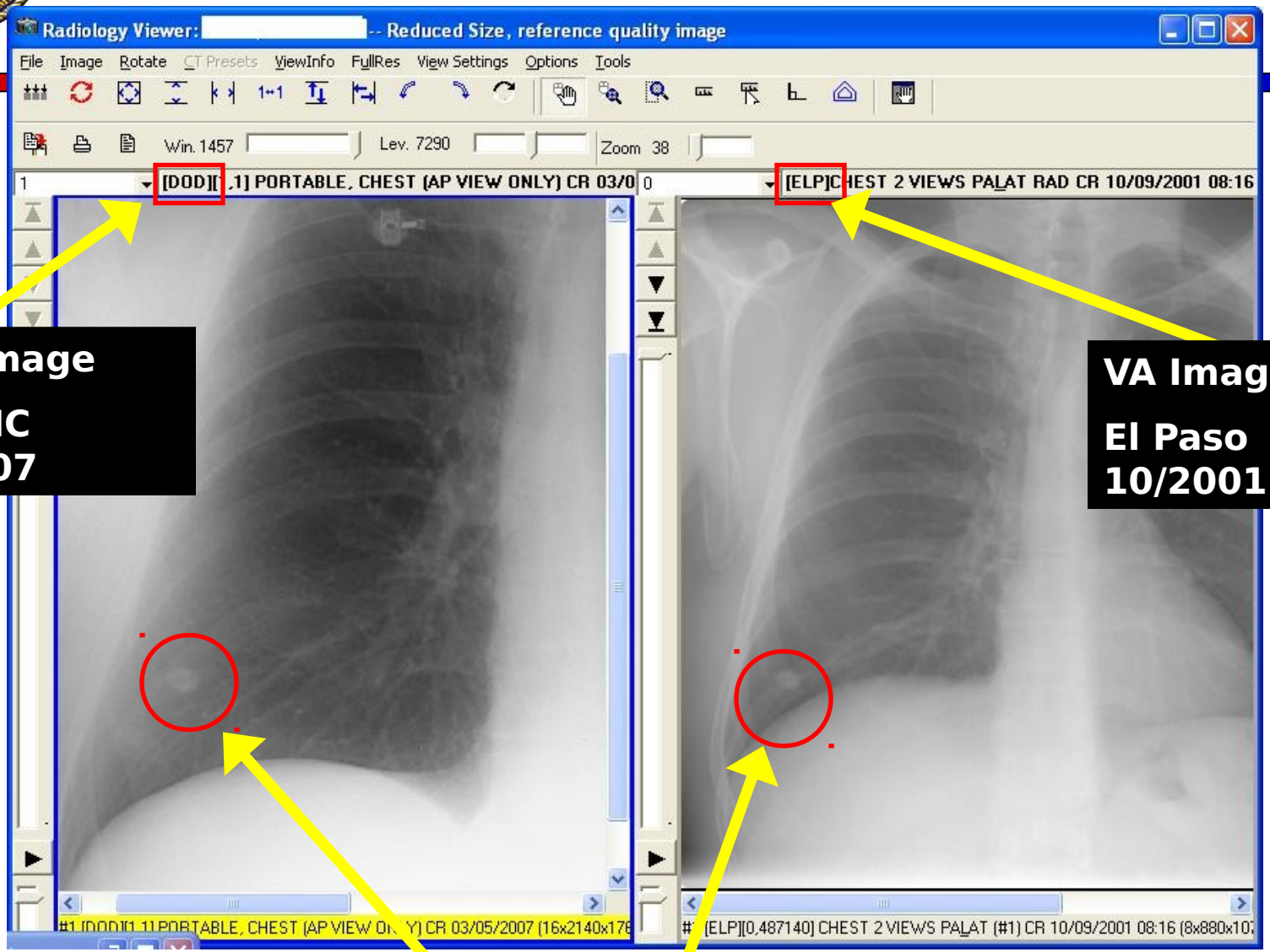
The text report box can be moved to uncover images and closed to view all images.

VA/DOD Medical Images Viewed Side by Side

VA/DOD Medical Image Reports Viewed Side by Side



Demonstration: Viewing DOD Images at the VA



DoD Image

WBAMC 03/2007

VA Image

El Paso 10/2001

Area of Clinical

QUESTIONS